

Application No. 10/692,545
Amendment dated January 16, 2007
Reply to Office Action of July 13, 2006

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-49 (cancelled).

50. (previously presented) A system for use in spinal surgery, said system comprising:

a cannula having a proximal end, a distal end opposite said proximal end, a mid-longitudinal axis passing through said proximal and distal ends, a length from said proximal end to said distal end, a sidewall connecting said proximal and distal ends, and a hollow interior, said sidewall completely surrounding the mid-longitudinal axis of said cannula along a majority of the length of said cannula; and

a surgical instrument comprising:

an elongated handle having opposed ends with a length therebetween, a height, and a rounded gripping portion along the length of said handle, the length of said handle being the maximum dimension of said handle, said handle having a midpoint half way between said opposed ends;

a shaft having a proximal end, a distal end, and a longitudinal central axis between said proximal and distal ends, said proximal end of said shaft being connected to said handle, the longitudinal central axis of said shaft extending through the height of said handle and being offset from the midpoint of said handle; and

an arm extending radially from said shaft proximate said distal end of said shaft, said arm terminating in a surface adapted to directly contact and displace cancellous bone in response to moving said shaft, said arm having a longitudinal axis extending through said shaft and through said surface, said surface being adapted to make a path through the cancellous bone in a plane perpendicular to the longitudinal central axis of said shaft, said shaft having a length sufficient to

Application No. 10/692,545
Amendment dated January 16, 2007
Reply to Office Action of July 13, 2006

permit said arm to extend beyond said distal end of said cannula when said shaft is inserted into said cannula.

51. (previously presented) The system of claim 50, wherein said surgical instrument further comprises a cylindrical portion having a height parallel to the longitudinal central axis of said shaft and a diameter transverse to the longitudinal central axis of said shaft, the diameter of said cylindrical portion being greater than the height of said cylindrical portion, said cylindrical portion forming a portion of said handle.
52. (previously presented) The system of claim 51, wherein said cylindrical portion is connected to said proximal end of said shaft.
53. (previously presented) The system of claim 51, wherein said handle has a width, the diameter of said cylindrical portion being greater than the width of said handle.
54. (previously presented) The system of claim 50, wherein said surface is a cutting blade.
55. (previously presented) The system of claim 50, wherein said surface forms a sharp tip.
56. (previously presented) The system of claim 50, wherein the length of said shaft is greater than the length of said handle.
57. (previously presented) The system of claim 50, wherein said surface is a cutting surface adapted to directly contact and cut cancellous bone in response to rotating said shaft, said cutting surface being adapted to make a radial cut through the cancellous bone in the plane perpendicular to the longitudinal central axis of said shaft.
58. (previously presented) A system for use in spinal surgery, said system comprising:
 - a tubular member having a proximal end, a distal end opposite said proximal end, a mid-longitudinal axis passing through said proximal and distal ends, a length from said proximal end to said distal end, a sidewall connecting

Application No. 10/692,545
Amendment dated January 16, 2007
Reply to Office Action of July 13, 2006

said proximal and distal ends, and a hollow interior, said sidewall completely surrounding the mid-longitudinal axis of said tubular member along a majority of the length of said tubular member; and

a surgical instrument comprising:

an elongated handle having opposed ends and a rounded gripping portion therebetween;

a shaft having a proximal end, a distal end, and a longitudinal central axis between said proximal and distal ends;

an arm extending radially from said shaft proximate said distal end of said shaft, said arm terminating in a surface adapted to directly contact and displace cancellous bone in response to moving said shaft, said arm having a longitudinal axis extending through said shaft and through said surface, said surface being adapted to make a path through the cancellous bone in a plane perpendicular to the longitudinal central axis of said shaft, said shaft having a length sufficient to permit said arm to extend beyond said distal end of said tubular member when said shaft is inserted into said tubular member; and

a cylindrical portion between the proximal end of said shaft and at least a portion of said handle, said cylindrical portion being connected to said proximal end of said shaft, said cylindrical portion having a maximum height parallel to the longitudinal central axis of said shaft and a diameter transverse to the longitudinal central axis of said shaft, the diameter of said cylindrical portion being greater than the maximum height of said cylindrical portion, the longitudinal central axis of said shaft passing through said cylindrical portion and a portion of said handle.

59. (previously presented) The system of claim 58, wherein said cylindrical portion is connected to said handle.
60. (previously presented) The system of claim 58, wherein said gripping portion of said handle has a length and a width, the diameter of said cylindrical portion being greater than the width of said gripping portion of said handle.

Application No. 10/692,545
Amendment dated January 16, 2007
Reply to Office Action of July 13, 2006

61. (previously presented) The system of claim 58, wherein said surface is a cutting blade.
62. (previously presented) The system of claim 58, wherein said surface forms a sharp tip.
63. (previously presented) The system of claim 58, wherein said gripping portion of said handle has a length, the length of said shaft being greater than the length of said gripping portion of said handle.
64. (previously presented) The system of claim 58, wherein said surface is a cutting surface adapted to directly contact and cut cancellous bone in response to rotating said shaft, said cutting surface being adapted to make a radial cut through the cancellous bone in the plane perpendicular to the longitudinal central axis of said shaft.
65. (previously presented) A system for use in spinal surgery, said system comprising:

a cannula having a proximal end, a distal end configured for engagement with at least one vertebral body of a human spine, a length therebetween, a mid-longitudinal axis passing through said proximal and distal ends, and a sidewall defining at least in part a passage connecting said proximal and distal ends, said sidewall completely surrounding the mid-longitudinal axis of said cannula along a majority of the length of said cannula; and

a surgical instrument comprising:

a shaft having a proximal end, a distal end, a longitudinal central axis, and a length between said proximal and distal ends, said instrument being adapted to be deployed into position to displace cancellous bone by movement of said shaft within and along said passage of said cannula;

an arm extending radially from said shaft proximate said distal end of said shaft, said arm terminating in a surface adapted to directly contact and displace cancellous bone in response to moving said shaft within said passage of said cannula, said surface having a maximum height from said shaft in a plane

Application No. 10/692,545
Amendment dated January 16, 2007
Reply to Office Action of July 13, 2006

perpendicular to the longitudinal central axis of said shaft, said arm having a longitudinal axis extending through said shaft and through said maximum height of said surface, said surface being adapted to make a path through the cancellous bone in a plane perpendicular to the longitudinal central axis of said shaft, the length of said shaft being sufficient to permit said arm to extend beyond said distal end of said cannula; and

a depth stop on said shaft adapted to limit over penetration of said shaft through said cannula.

66. (previously presented) The system of claim 65, wherein said depth stop comprises a shoulder circumferentially surrounding said shaft.
67. (previously presented) The system of claim 66, wherein said depth stop has a diameter greater than a diameter of said passage of said cannula.
68. (previously presented) The system of claim 65, wherein said depth stop includes a lower surface adapted to abut the proximal end of said cannula to limit movement of said instrument through said cannula.
69. (previously presented) The system of claim 65, wherein said surface includes a tip spaced apart from the longitudinal central axis of said shaft and said depth stop has an outer perimeter in a plane transverse to the longitudinal central axis of said shaft, at least a portion of the outer perimeter of said depth stop being closer to the longitudinal central axis of said shaft than said tip.
70. (previously presented) The system of claim 65, wherein said surgical instrument further comprises an elongated handle having opposed ends and a rounded gripping portion therebetween, said handle having a midpoint half-way between said opposed ends.
71. (previously presented) The system of claim 70, wherein said depth stop comprises a cylindrical portion having a maximum height parallel to the longitudinal central axis of said shaft and a diameter transverse to the longitudinal central axis of said shaft, the diameter of said cylindrical portion being greater than the maximum height of said cylindrical portion.

Application No. 10/692,545
Amendment dated January 16, 2007
Reply to Office Action of July 13, 2006

72. (previously presented) The system of claim 71, wherein said cylindrical portion is connected to said proximal end of said shaft.
73. (previously presented) The system of claim 70, wherein said gripping portion of said handle has a length and a width, the diameter of said cylindrical portion being greater than the width of said gripping portion of said handle.
74. (previously presented) The system of claim 65, wherein said surface is a cutting blade.
75. (previously presented) The system of claim 65, wherein said surface forms a sharp tip.
76. (previously presented) The system of claim 70, wherein said gripping portion of said handle has a length, the length of said shaft being greater than the length of said gripping portion of said handle.
77. (previously presented) The system of claim 65, wherein said surface is a cutting surface adapted to directly contact and cut cancellous bone in response to rotating said shaft, said cutting surface being adapted to make a radial cut through the cancellous bone in the plane perpendicular to the longitudinal central axis of said shaft.
78. (previously presented) The system of claim 65, wherein said arm has a maximum width transverse to the longitudinal axis of said arm, said surface having a maximum width parallel to the longitudinal central axis of said shaft, the maximum width of said surface being no greater than the maximum width of said arm.
79. (previously presented) The system of claim 65, wherein said surface has a point most distal from said proximal end of said shaft, said distal-most point of said surface extending no more distally than said distal end of said shaft.
80. (previously presented) The system of claim 65, wherein said surface has a point most distal from said proximal end of said shaft, said distal-most point of said surface being co-planar with said distal end of said shaft in a plane perpendicular to the longitudinal central axis of said shaft.

Application No. 10/692,545
Amendment dated January 16, 2007
Reply to Office Action of July 13, 2006

81. (previously presented) The system of claim 65, wherein said surface has a straight cutting edge.
82. (previously presented) The system of claim 65, wherein said surface is multi-faceted.
83. (previously presented) The system of claim 50, wherein said arm has a maximum width transverse to the longitudinal axis of said arm, said surface having a maximum width parallel to the longitudinal central axis of said shaft, the maximum width of said surface being no greater than the maximum width of said arm.
84. (previously presented) The system of claim 50, wherein said surface has a point most distal from said proximal end of said shaft, said distal-most point of said surface extending no more distally than said distal end of said shaft.
85. (previously presented) The system of claim 50, wherein said surface has a point most distal from said proximal end of said shaft, said distal-most point of said surface being co-planar with said distal end of said shaft in a plane perpendicular to the longitudinal central axis of said shaft.
86. (previously presented) The system of claim 50, wherein said surface has a straight cutting edge.
87. (previously presented) The system of claim 50, wherein said surface is multi-faceted.
88. (previously presented) The system of claim 58, wherein said arm has a maximum width transverse to the longitudinal axis of said arm, said surface having a maximum width parallel to the longitudinal central axis of said shaft, the maximum width of said surface being no greater than the maximum width of said arm.
89. (previously presented) The system of claim 58, wherein said surface has a point most distal from said proximal end of said shaft, said distal-most point of said surface extending no more distally than said distal end of said shaft.

Application No. 10/692,545
Amendment dated January 16, 2007
Reply to Office Action of July 13, 2006

90. (previously presented) The system of claim 58, wherein said surface has a point most distal from said proximal end of said shaft, said distal-most point of said surface being co-planar with said distal end of said shaft in a plane perpendicular to the longitudinal central axis of said shaft.
91. (previously presented) The system of claim 58, wherein said surface has a straight cutting edge.
92. (previously presented) The system of claim 58, wherein said surface is multi-faceted.
93. (previously presented) A system for use in spinal surgery, said system comprising:
- a tubular member having a proximal end, a distal end opposite said proximal end, a mid-longitudinal axis passing through said proximal and distal ends, a length from said proximal end to said distal end, a sidewall connecting said proximal and distal ends, and a hollow interior, said sidewall completely surrounding the mid-longitudinal axis of said tubular member along a majority of the length of said tubular member; and
 - a surgical instrument comprising:
 - an elongated handle having first and second opposed ends, a length therebetween, the length being the maximum dimension of said handle, and a rounded gripping portion along the length; and
 - an elongated member having a proximal end, a distal end, and a central longitudinal axis, said elongated member having a plane passing therethrough and extending along the central longitudinal axis, said proximal end of said elongated member being connected to said handle, the central longitudinal axis of said elongated member extending through said distal end and said handle between said first and second opposed ends, said elongated member having a bone-contacting surface having a perimeter with a first linear edge portion and a second linear edge portion opposite said first linear edge portion, at least one of said linear edge portions being adapted to contact and displace bone in

Application No. 10/692,545
Amendment dated January 16, 2007
Reply to Office Action of July 13, 2006

response to rotating said elongated member about its central longitudinal axis, said first and second linear edge portions of said bone contacting surface being on the same side of the plane extending along the central longitudinal axis of said elongated member;

each of said first and second opposed ends of said handle having a point most-distant from the central longitudinal axis of said elongated member, the length of said handle being in a longitudinal plane with the central longitudinal axis of said elongated member, said most-distant points of said first and second opposed ends of said handle being in respective first and second planes that are parallel to one another and perpendicular to the longitudinal plane, said bone-contacting surface of said elongated member being between the first and second planes of said first and second opposed ends of said handle.

94. (previously presented) The system of claim 93, wherein said bone-contacting surface is adapted to cut bone.
95. (previously presented) The system of claim 93, wherein said bone-contacting surface is adapted to make a radial cut through the bone in a plane perpendicular to the central longitudinal axis of said elongated member.

Claim 96 (cancelled).

97. (previously presented) The system of claim 93, wherein said first and said second linear edge portions are at an angle relative to one another.
98. (previously presented) The system of claim 93, wherein the length of said handle is perpendicular to the central longitudinal axis of said elongated member.
99. (previously presented) An apparatus for use in spinal surgery for displacing bone, said apparatus comprising:

a tubular member having a proximal end, a distal end opposite said proximal end, a mid-longitudinal axis passing through said proximal and distal ends, a length from said proximal end to said distal end, a sidewall connecting said proximal and distal ends, and a hollow interior, said sidewall completely

Application No. 10/692,545
Amendment dated January 16, 2007
Reply to Office Action of July 13, 2006

surrounding the mid-longitudinal axis of said tubular member along a majority of the length of said tubular member; and

a bone displacement device including a handle having opposed ends and a rounded gripping portion therebetween, an elongated member connected to said handle, said elongated member having a central longitudinal axis, and a bone displacement portion having a first bone-contacting edge and a second bone-contacting edge opposite said first bone-contacting edge, said first and second bone-contacting edges being at an angle relative to one another and at an angle to the central longitudinal axis of said elongated member, said bone displacement device having a length along said elongated portion that is greater than the length of said tubular member sufficient to permit said arm to extend beyond said distal end of said tubular member, said bone displacement portion having a height from the central longitudinal axis of said elongated member that permits at least a portion of said bone displacement portion to extend radially beyond the perimeter of said sidewall of said tubular member in a plane transverse to the mid-longitudinal axis of said tubular member.

100. (previously presented) The apparatus of claim 99, wherein said bone displacement portion is adapted to cut bone.
101. (previously presented) The apparatus of claim 99, wherein said bone displacement portion is adapted to make a radial cut through the bone in a plane perpendicular to the central longitudinal axis of said elongated member.
102. (previously presented) The apparatus of claim 99, wherein said handle has a length which is the maximum dimension of said handle, the length of said handle being perpendicular to the central longitudinal axis of said elongated member.
103. (previously presented) The apparatus of claim 99, wherein at least one of said edges is sufficiently sharp to make a radial cut into the bone.
104. (previously presented) The apparatus of claim 99, wherein said sidewall has an opening in communication with said interior of said tubular member.

Application No. 10/692,545
Amendment dated January 16, 2007
Reply to Office Action of July 13, 2006

105. (previously presented) The apparatus of claim 99, wherein at least a portion of said bone displacement portion is adapted to extend from said distal end of said tubular member when said bone displacement device is inserted into said tubular member.

Claim 106 (cancelled).

107. (previously presented) The system of claim 65, wherein said depth stop has a width and a height, the width of said depth stop being greater than the height of said depth stop.
108. (previously presented) The system of claim 93, wherein said bone-contacting surface includes a sharp portion.
109. (previously presented) A system for use in spinal surgery, said system comprising:

a cannula having a proximal end, a distal end opposite said proximal end, a mid-longitudinal axis passing through said proximal and distal ends, a length from said proximal end to said distal end, a sidewall connecting said proximal and distal ends, and a hollow interior, said sidewall completely surrounding the mid-longitudinal axis of said cannula along a majority of the length of said cannula; and

a surgical instrument comprising:

an elongated handle having opposed ends with a length therebetween, and a rounded gripping portion, the length of said handle being the maximum dimension of said handle, said handle having a midpoint half way between said opposed ends;

a shaft having a proximal end, a distal end, and a longitudinal central axis between said proximal and distal ends, said proximal end of said shaft being connected to said handle, the longitudinal central axis of said shaft extending through said gripping portion of said handle, the longitudinal central axis of said shaft being offset from the midpoint of said handle and at an angle to the length

Application No. 10/692,545
Amendment dated January 16, 2007
Reply to Office Action of July 13, 2006

of the handle, the length of said shaft being sufficient to permit said arm to extend beyond said distal end of said cannula; and

an arm extending radially from said shaft proximate said distal end of said shaft, said arm terminating in a surface adapted to directly contact and displace cancellous bone in response to moving said shaft, said arm having a longitudinal axis extending through said shaft and through said surface, said surface being adapted to make a path through the cancellous bone in a plane perpendicular to the longitudinal central axis of said shaft.

110. (previously presented) The system of claim 109, wherein said surgical instrument further comprises a cylindrical portion having a height parallel to the longitudinal central axis of said shaft and a diameter transverse to the longitudinal central axis of said shaft, the diameter of said cylindrical portion being greater than the height of said cylindrical portion, said cylindrical portion forming a portion of said handle.
111. (previously presented) The system of claim 110, wherein said cylindrical portion is connected to said proximal end of said shaft.
112. (previously presented) The system of claim 110, wherein said handle has a width, the diameter of said cylindrical portion being greater than the width of said handle.
113. (previously presented) The system of claim 109, wherein said surface is a cutting blade.
114. (previously presented) The system of claim 109, wherein said shaft has a length, the length of said shaft being greater than the length of said handle.
115. (previously presented) The system of claim 109, wherein said surface is adapted to directly contact and cut cancellous bone in response to rotating said shaft, said cutting surface being adapted to make a radial cut through the cancellous bone in the plane perpendicular to the longitudinal central axis of said shaft.
116. (previously presented) The system of claim 109, wherein said arm has a maximum width transverse to the longitudinal axis of said arm, said surface

Application No. 10/692,545
Amendment dated January 16, 2007
Reply to Office Action of July 13, 2008

having a maximum width parallel to the longitudinal central axis of said shaft, the maximum width of said surface being no greater than the maximum width of said arm.

117. (previously presented) The system of claim 109, wherein said surface has a point most distal from said proximal end of said shaft, said distal-most point of said surface extending no more distally than said distal end of said shaft.
118. (previously presented) The system of claim 109, wherein said surface has a point most distal from said proximal end of said shaft, said distal-most point of said surface being co-planar with said distal end of said shaft in a plane perpendicular to the longitudinal central axis of said shaft.
119. (previously presented) The system of claim 109, wherein said surface has a straight cutting edge.
120. (previously presented) The system of claim 109, wherein said surface is multi-faceted.
121. (new) The system of claim 93, wherein said first linear edge portion and said second linear edge portion are bisected by a mid-longitudinal axis therebetween, the mid-longitudinal axis between said first linear edge portion and said second linear edge portion extending through the central longitudinal axis of said elongated member.
122. (new) The system of claim 99, wherein said bone displacement portion having a longitudinal axis extending through the height of said bone displacement portion and through the central longitudinal axis of said elongated member.